

# MATERIAL GRADES

MATERIAL NO.	DESIGNATION	CHEMICAL COMPOSITION	STRENGTH	COLOUR	CHARACTER	APPLICATIONS
1.0577	DIN: S 355 J2 (St 52-3) AFNOR: A 52 FP AISI: A738	C ≤ 0.22 Si ≤ 0.55 Mn ≤ 1.60	132 - 185 HB (≈ 450 - 630 N/mm <sup>2</sup> )	Fluorescent yellow	Structural steel unalloyed, with good weldability	For common applications in mould, die, and jigs and fixtures construction
1.1730	DIN: C 45 U AFNOR: XC 48 AISI: 1045	C 0.45 Si 0.30 Mn 0.70	180 - 195 HB (≈ 610 - 660 N/mm <sup>2</sup> )	Traffic blue	Tool steel unalloyed, suitable for flame hardening	Unhardened parts for mould, die and jig construction; plates and frames for mould bases and die sets
1.2083	DIN: X 40 Cr 14 AFNOR: Z 40 C 14 AISI: 420	C 0.40 Si 0.40 Mn 0.30 Cr 13.00	max. 240 HB (≈ max. 800 N/mm <sup>2</sup> )	Lemon yellow	Steel for through hardening low corrosion, high-alloy	Cavity plates and inserts for the processing of plastics, mainly used for processing corrosive plastics
1.2083 ESR	DIN: X 40 Cr 14 AFNOR: Z 40 C 14 AISI: 420 ESR	C 0.40 Si 0.40 Mn 0.30 Cr 13.00	max. 240 HB (≈ max. 800 N/mm <sup>2</sup> )	Reseda green	Steel for through hardening low corrosion, suitable for mirror polishing, electro-slag remelted, high-alloy	Cavity plates and inserts for the processing of plastics, mainly used for processing corrosive plastics
1.2085	DIN: X 33 CrS 16 AFNOR: Z 35 CD 17.5 AISI: ≈ 422+S	C 0.33 Si 0.30 Mn 0.80 Cr 16.00 S 0.06 Ni 0.30	280 - 325 HB (≈ 950 - 1100 N/mm <sup>2</sup> )	Yellow green	Tool steel pre-hardened, corrosion resistant, good machinability, high-alloy	Plates for corrosion resistant mould bases and die sets; moulds for processing corrosive plastics
1.2162	DIN: 21 MnCr 5 AFNOR: 20 MC 5 AISI: 5120	C 0.21 Si 0.25 Mn 1.25 Cr 1.20	max. 210 HB (≈ max. 710 N/mm <sup>2</sup> )	Mint green	Steel for case-hardening alloyed	Cavity plates and machine parts
1.2210	DIN: 115 CrV 3 AFNOR: 100 C3 UNI: 107 CrV 3 KU AISI: L2	C 1.18 Si 0.25 Mn 0.30 Cr 0.70 V 0.10	max. 220 HB (≈ max. 750 N/mm <sup>2</sup> )	Bronze - gold	Cold-work steel alloyed, wear-resistant	Core pins, punches, small turned parts
1.2311	DIN: 40 CrMnMo 7 AFNOR: 40 CMD 8 UNI: 35 CrMo 8 KU AISI: P20	C 0.40 Si 0.40 Mn 1.50 Cr 1.90 Mo 0.20	280 - 325 HB (≈ 950 - 1100 N/mm <sup>2</sup> )	Pure white	Tool steel alloyed, hardened and tempered, ideal for nitriding, suitable for polishing	Cavity plates, inserts and high-tensile machine parts
1.2312	DIN: 40 CrMnMoS 8-6 AFNOR: 40 CMD 8.5 AISI: P20+S	C 0.40 Si 0.40 Mn 1.50 Cr 1.90 Mo 0.20 S 0.06	280 - 325 HB (≈ 950 - 1100 N/mm <sup>2</sup> )	Traffic purple	Tool steel alloyed, hardened and tempered, ideal for nitriding, good machinability	Plates for mould bases and die sets with increased strength requirements
1.2316	DIN: X 38 CrMo 16 AFNOR: Z 35 CD 17 UNI: X 38 CrMo 16 KU AISI: ≈ 422	C 0.36 Si 16.00 Cr 1.20	280 - 325 HB (≈ 950 - 1100 N/mm <sup>2</sup> )	Fluorescent red	Tool steel hardened and tempered, corrosion resistant, polishable, high-alloy	Moulds for processing corrosive plastics
1.2343	DIN: X 37 CrMoV 5-1 AFNOR: Z 38 CDV 5 UNI: X 37 CrMoV 5-1 KU AISI: H11	C 0.38 Si 1.00 Mn 0.40 Cr 5.30 Mo 1.20 V 0.40	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Carmine red	Hot-work steel high-alloy	Cavity plates and inserts for injection moulds
1.2343 ESR	DIN: X 37 CrMoV 5-1 AFNOR: Z 38 CDV 5 UNI: X 37 CrMoV 5-1 KU AISI: H11 ESR	C 0.38 Si 1.00 Mn 0.40 Cr 5.30 Mo 1.20 V 0.40	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Light pink	Hot-work steel suitable for mirror polishing, electro-slag remelted, high-alloy	Cavity plates and inserts for die casting (Al, Mg, Zn etc.) and injection moulds
1.2344	DIN: X 40 CrMoV 5-1 AFNOR: Z 40 CDV 5 UNI: X 40 CrMoV 5-1 KU AISI: H13	C 0.40 Si 1.00 Cr 5.30 Mo 1.40 V 1.00	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Pastel turquoise	Hot-work steel high-temperature resistant, high temperature wear resistant, excellent thermal conductivity, high-alloy	Standard material for hot-work tools, extrusion moulds, dies, tools for plastic processing
1.2344 ESR	DIN: X 40 CrMoV 5-1 AFNOR: Z 40 CDV 5 UNI: X 40 CrMoV 5-1 KU AISI: H13 ESR	C 0.40 Si 1.00 Cr 5.30 Mo 1.40 V 1.00	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Steel blue	Hot-work steel suitable for mirror polishing, electro-slag remelted, high-alloy	Standard material for hot-work tools, extrusion moulds, dies, moulds for plastic processing
1.2363	DIN: X 100 CrMoV 5 AFNOR: Z 100 CDV 5 UNI: X 100 CrMoV 5-1 KU AISI: A2	C 1.00 Si 0.30 Mn 0.50 Cr 5.20 Mo 1.10 V 0.20	max. 240 HB (≈ max. 820 N/mm <sup>2</sup> )	Concrete grey	Steel for through hardening dimensional stability and high hardenability; wear-resistant, cold-work steel with good machinability	Cavity plates and inserts as well as cutting punches, wear plates and cutting dies with high toughness requirements
1.2379	DIN: X 153 CrMoV 12 AFNOR: Z 160 CDV 12 AISI: ≈ D2	C 1.53 Si 0.30 Mn 0.35 Cr 12.00 Mo 0.80 V 0.80	max. 255 HB (≈ max. 860 N/mm <sup>2</sup> )	Pastel orange	Steel for through hardening wear-resistant, high-alloy cold-work steel	Cavity plates and inserts as well as wear plates and cutting dies with increased wear resistance
1.2714	DIN: 55 NiCrMoV 7 AFNOR: 55 NCDV 7 AISI: L6	C 0.56 Cr 1.10 Mo 0.50 Ni 1.70 V 0.10	max. 250 HB (≈ max. 850 N/mm <sup>2</sup> )	Pastel green	Steel for through hardening good high-temperature resistance and toughness	Extrusion dies, hot-forging tools, dies for processing tin, lead and zinc alloys
1.2714 HH	DIN: 55 NiCrMoV 7 AFNOR: 55 NCDV 7 AISI: L6	C 0.56 Cr 1.10 Mo 0.50 Ni 1.70 V 0.10	41 - 45 HRC (≈ 1300 - 1450 N/mm <sup>2</sup> )	Beige	Steel for through hardening hardened and tempered; good high-temperature resistance and toughness	Mould inserts, cores and slides for injection moulds
1.2738	DIN: 40 CrMnNiMo 8-6-4 AFNOR: 40 CMND 8 AISI: ≈ P20 + Ni	C 0.40 Si 0.30 Mn 1.50 Cr 1.90 Mo 0.20 Ni 1.10	280 - 325 HB (≈ 950 - 1100 N/mm <sup>2</sup> )	Turquoise blue	Tool steel hardened and tempered; uniform strength even in plates and bars with larger dimensions; suitable for polishing and nitriding	Large cavity plates with deep cavities for items such as bumpers or dashboards
1.2738 TSHH	DIN: Special alloy	C 0.26 Mn 1.45 Cr 1.25 Mo 0.50 Ni 1.05 V 0.12	33 - 38 HRC (≈ 1050 - 1200 N/mm <sup>2</sup> )	Signal grey	Steel for plastic moulds modified, hardened and tempered; good polishability and excellent grainability; high thermal conductivity and wear resistance	Cavity plates without dimension restrictions, with deep cavities and high core loads
1.2767	DIN: 45 NiCrMo 16 AFNOR: 45 NCD 16 UNI: 40 NiCrMoV 16 KU AISI: ≈ 6F7	C 0.45 Si 0.25 Mn 0.40 Cr 1.35 Mo 0.25 Ni 4.00	max. 280 HB (≈ max. 950 N/mm <sup>2</sup> )	Jet black	Steel for through hardening alloy, suitable for polishing, with high resistance to pressure and good flexural strength	High-performance cavity plates and inserts; cutting and bending inserts for high compressive loads
1.2842	DIN: 90 MnCrV 8 AFNOR: 90 MV 8 UNI: 90 MnVCr 8 KU AISI: ≈ O2	C 0.90 Si 0.20 Mn 2.00 Cr 0.40 V 0.10	max. 230 HB (≈ max. 780 N/mm <sup>2</sup> )	Clay brown	Steel for through hardening dimensional stability and high hardenability; wear-resistant, cold-work steel with very good machinability	Cavity plates and inserts exposed to abrasive stress; cutting punches; wear plates, cutting dies and guiding plates; guiding rails
1.3343 (HSS)	DIN: HS 6-5-2 C AFNOR: Z 85 WDCV 6 UNI: X 82 WMoV 6 5 AISI: M 2 reg. C	C 0.90 Si 0.30 Mn 0.30 Cr 4.00 Mo 5.00 V 1.90 W 6.20	max. 269 HB (≈ max. 915 N/mm <sup>2</sup> )	Daffodil yellow	High-speed steel (HSS) very high resistance to adhesion and wear in combination with high toughness and compressive strength	Blocks for eroding, cutting and fine blanking punches; impact extrusion punches and dies; inserts with a very high wear resistance
1.3344 PM	DIN: PM 6-5-3 AFNOR: X 130 WMoCrV 6-5-4-3 UNI: W 6 Mo 5 Cr 4 V 3 AISI: M 3-2 (PM)	C 1.25 Si 0.30 Mn 0.30 Cr 4.0 Mo 5.0 V 3.0 W 6.2	max. 265 HB (≈ max. 905 N/mm <sup>2</sup> )	Bronze - silver	Powder metallurgical steel highest resistance to adhesion and wear in combination with optimal toughness, ideal for through hardening	Blocks for eroding, cutting punches and dies with particularly durable edges; inserts with highest wear resistance
1.7131	DIN: 16 MnCr 5 AFNOR: 16 MC 5 AISI: 5115	C 0.16 Si 0.25 Mn 1.15 Cr 0.95	max. 186 HB (≈ max. 635 N/mm <sup>2</sup> )	Blue lilac	Steel for case-hardening alloy	Guiding elements, cores and machine parts
1.7225	DIN: 42 CrMo 4 AFNOR: 42 CD 4 UNI: 42 CrMo 4 AISI: 4140	C 0.42 Si 0.25 Mn 0.75 S <0.035 Cr 1.10 Mo 0.22	max. 217 HB (≈ max. 740 N/mm <sup>2</sup> )	Night blue	Tempered steel high strength and toughness, universally usable in jigs and fixtures	Jigs and fixtures, base plates, shafts, gear shafts, gear wheels
3.3547 (AW-5083)	DIN: AlMg 4.5 Mn EN: AW-5083 AFNOR: A-G4.5MC UNI: 7790	Si 0.40 Fe 0.10 Cu 0.70 Mn 4.40 Cr 0.15 Zn 0.25 Ti 0.15	68 - 75 HB (≈ 230-260 N/mm <sup>2</sup> ) min. 78 HB (≈ min. 270 N/mm <sup>2</sup> )	Yellow green	Aluminium alloy	Plates for mould bases, jigs and fixtures
3.4365 (AW-7075)	DIN: AlZnMgCu 1.5 EN: AW-7075 AFNOR: A-Z5GU UNI: 9007/2	Si 0.40 Fe 0.50 Cu 1.60 Mn 0.30 Mg 2.40 Cr 0.23 Zn 5.60 Ti 0.20	max. 158 HB (≈ max. 540 N/mm <sup>2</sup> )	Turquoise blue	Aluminium - zinc alloy high-strength, hardened	Plates for mould bases and die sets with increased strength requirements
M V10 PM	AISI: A11	C 2.45 Si 0.90 Mn 0.50 Cr 5.20 Mo 1.30 V 9.75	max. 280 HB (≈ max. 960 N/mm <sup>2</sup> )	Turquoise green	Powder metallurgical steel highest abrasive wear resistance and excellent toughness; good machinability through a homogeneous microstructure	Blocks for eroding, dies and cutting punches with extreme requirements, fine blanking punches, pressing punches for sinter press tools
M W10 PM	EN: HS 10-2-5-8	C 1.60 Cr 4.80 Mo 2.00 V 5.00 W 10.50 Co 8.00	max. 285 HB (≈ max. 970 N/mm <sup>2</sup> )	Claret violet	Powder metallurgical steel high adhesive wear resistance and excellent toughness; very high working hardness and therefore highest compressive strength possible	Blocks for eroding, dies, cutting punches and cutting tools for extremely high requirements, fine blanking punches, embossing tools, cold solid forming
CF-H40S+	ISO: K40 US Industry: C11/C12	WC 86.6 Co 11.8			Carbide the universal carbide grade - the ideal compromise between hardness and fracture toughness with high edge stability.	Blocks for eroding, cutting punches and dies with maximum wear resistance; active parts for stamping, embossing, bending and forming

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